

ERIC Document Resume		See Instruction Sheet		DATE OF RESUME		DATE RECEIVED	
A. PUBLICATION DATA							
1. ERIC NUMBER ED002417		2. ORIGINATOR CONTROL NO(S). N.A.		3. IDENTIFICATION NO. N.A.		DO NOT WRITE IN SPACE BELOW	
4. AUTHOR(S): N.A.				MICROFILM COPY AVAILABLE YES ☒ NO ☐			
5. TITLE OF DOCUMENT ABSTRACTED: Organization III Nova Science Unit 4				COPYRIGHT GRANTED YES ☐ NO ☒			
6. PUBLICATION TITLE: N.A.				COPYRIGHT RELEASE FILED YES ☐ NO ☐			
7. EDITOR(S): N.A.		8. PLACE OF ORIGIN Nova High ORG. School ST. Fort Lauderdale, CITY, STATE Florida		TYPE OF REPORT PROPOSAL ☐ IN-PROGRESS ☐ FINAL ☒ FOLLOW-UP ☐			
9. PUBLISHER OR SOURCE Nova High School Fort Lauderdale, Florida		10. VOL. N.A.		11. PAGES N.A.		12. MO./YR. N.A.	
		13. TOTAL PP. 11		TELE. EXT. INST/LOC CODE		OTHER ERIC REFERENCES:	
B. INDEXING DATA							
14. SUBJECT AREA				15. TYPE OF ENDEAVOR Teacher's Guide			
16. INDEXING TERMS (8-12)				classification			
laboratory experiments				science			
secondary education				sorting			
curriculum guide				collecting			
17. ABSTRACT (MAX. 250 WORDS)							
A science unit on organization is presented. The observation and categorization of living things are emphasized. Students are required to gather specimens of plant and animal life and to look for differences and similarities among them. This collecting and gross sorting of specimens are encouraged through laboratory exercises; data sheets are used as a means of recording and organizing information.							
ERIC No.							
18. SOURCE OF ABSTRACT							
C. FUNDING DATA							
19. SUPPORTING ORGANIZATION				20. DIVISION OR DEPT.		21. CONTRACT NO.	
				22. TOTAL COST OF PROJECT		PROJECT NO.	
				23. DURATION OF PROJECT		U.S. Department of Health, Education, and Welfare Office of Education	

ED002417

rec'd Apr. '64

Organization

111

NOVA SCIENCE UNIT 4



U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

50697

ED00 2417

We have concerned ourselves with classifying elements and seen that there are orderly arrangements. What good are these orderly arrangements? Look at the periodic chart. Make a list of several things it is good for (no nonsense, now we know the paper it is printed on, could be used to start a fire). Concentrate on the usefulness of the table. What are a few things it is not good for? Could it be expanded to include the things you listed, or would it be easier to build more tables? What are some difficulties in using one table for everything? Maybe you need a table of tables--what could you call this?

Look around the room for things that are not categorized on the table. Can you find a simple way to divide the material into groups? Find the simplest way to divide all the things into two groups. What methods could you use to settle disputes about what goes in each group?

How did the others in the room divide things?

As far back as there is any history of science people have been trying to organize the forms of life on earth. Of course, in the early civilization, not too many forms of life were known. The reasoning processes were not bad, however. Through the years the organizations methods have changed as new forms were discovered. In the next units we will follow some of the methods of organization and learn of the problems of organizing such a diverse field.

We are going to observe several living things and try to categorize them. In order to group these forms of life, it is necessary to keep and observe them. We have chosen several organisms as you can. Be sure to include its food and other life needs and methods for obtaining them.

Remember your experiences in the other units. Make up some data sheets and see how many ways you can organize these living things on the data tables. Can you get more than one relationship on one table? Do it. Be prepared to explain your reasons to the class. All of your reasonings must be based on observations that you have made.

Make a list of five other living things that you have seen and feel that others would know what they look like. This list will be exchanged for another list. When you get a list from someone else, try to relate these living things to the four that you have already categorized. Do they fit in well? Do you have to make any changes in your table? Maybe you will have to add a new column. Do it if you must and share your information if you are called upon to do so.

Now that you have an expanded table of classification, your teacher will give you a list of organisms to add to your table. If the system you have devised is a good one, you should be able to fit new organisms into the systems with very little trouble. After all, organization should allow us to relate the known to new discoveries.

If you have any difficulties with this system, go back over it and see how it can be improved. Make a list of any troubles that you find with your system. This list should be in such a form that you can present it to the class.

So far we have been organizing organisms in any way that we see fit. Now let's see if we can find out more about these organisms so that we can organize or classify them in a more intelligent manner.

Let's look at the Life Processes that an organism carries on. By the way, what do we mean by the term "Life Processes"? When you have found out what the term life processes means make a list of all of the life processes that you can think of that an organism carries on. Compare your list with that of your neighbors. Are there any that your neighbor has that you don't have? If there are any that you feel that you have left out, add them to your list. Is there any disagreement between you and your neighbor on any of the items on your list. Is there any disagreement between you and your neighbor on any of the items on your lists. (Remember you should be able to give reasons as to why you listed certain items as life processes). If there are any loose ends, your teacher will help clear these up for you.

Now that we have an understanding of what life processes are and we have made a list of the various life processes, let's see if we can do some experimenting to see if various organisms actually carry on some of these life processes. Let's use the organisms that we have been working with.

(EXPERIMENTS)

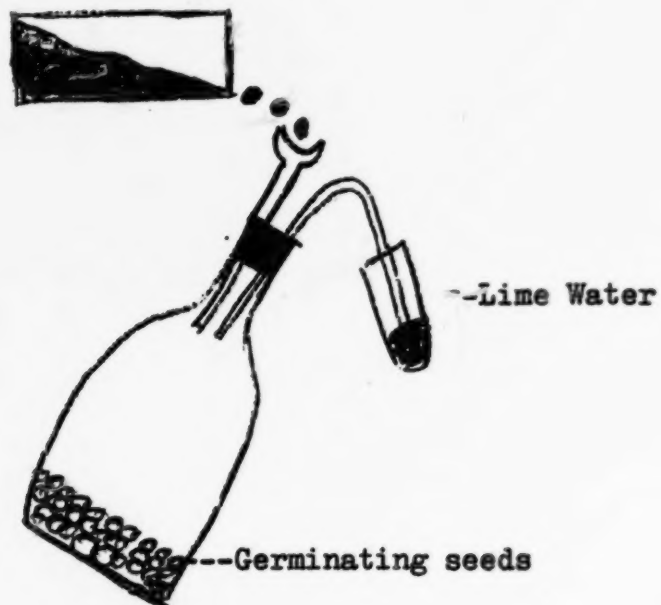
You have done just a few experiments to show some of the life processes that are carried on by these organisms. There are many other experiments to show that organisms carry all of the life processes. If you wish, you may pursue this further.

The first experiment that we will do will deal with the life process of respiration.

In this experiment we will be concerned with what gas is released in respiration. One can determine whether or not the gas released from an organisms contains CO_2 in easily observed quantities by bubbling the gas through lime water. When the lime water turns milky it indicates the presence of CO_2 .

1. The gas given off by humans: Exhale through a straw or gas tube into some lime water. Record the results.
2. The gas given off by germinating bean seeds: Soak some bean seeds overnight, then place them in a 250 ml flask (or a similar size wide mouth bottle.) Allow the seeds to germinate for 2 or 3 days. Using the apparatus pictured below, force the air around the seed through the limewater in the test tube. Record your results. Compare these results with the results you obtained in part 1

Water being poured into a flask to displace air around the seed.



The second experiment will deal with the life processes of nutrition.

1. Take 3 bean seedlings, put one into a container without any soil in it, take the second and place it in a container that just has water in it, take the third and place it in a container that has soil in it. Observe the seedlings each day. Record your observations.
2. Test for nutrients in various food that we eat.

Materials needed:

- a. Benedict solution
- b. Iodine
- c. Biuret reagent
- d. Bunsen burners
- e. Test tubes
- f. Stirring rod
- g. Various foods

PROCEDURE:

- a. Place food to be tested at the bottom of the test tube.
- b. Add a small amount of water to the food. Shake the tube thoroughly to be sure that the water and the food are mixed.

TESTS:

Starch - Add a small amount of iodine solution (5 drops), shake the tube, A blue-black indicated that starch is present. Record your observations.

Sugar - Add 20 drops of Benedict's solution. Shake the tube, heat the tube for 30 seconds. A bright red-orange or yellow color indicates the presence of sugar. Record your observations.

For Protein - Prepare another tube containing just water, add 10 drops of Biuret reagent to this tube and 10 drops of the reagent to the tube containing the food. A violet color indicates the presence of protein. Record your investigations.

For Fats - Do not add water to the food sample when you test for fat. Why? Simply rub (if the food is solid) or spill (if it is a liquid) the food on a piece of paper. If the food is mixed with water the paper will get wet. Allow the paper to dry. Then hold the paper up to the light. A relatively permanent spot indicates the presence of fat. Record.

All you need to do is look around you in the room, and you will see motion in life. You must move to do this. Do all living things move? If they do, how do they accomplish this motion? Why do they move if they move? Let us investigate this.

You have learned that some investigations require time. Eggs must hatch, plants must germinate and grow. Since you haven't seen any plant races, they must not move fast if they move at all. Therefore, it would be wise to start experiments with plants.

What does the plant need? Most of you will say "sunlight", food, and water." Let's see if it will move for these. Observe your plants. Unless you have tempered with them, you shouldn't find any that are confused - that is, none have their leaves growing down underground and their roots sticking up. What would happen if you turned one over? Be sure to keep written records of direction and shape. The questions we might ask are "Does the plant turn up from the earth no matter how we place it?" Devise some experiments to find the answers to these questions. Can you think of any other changes that the plant would respond to? Add these to your records and try to get answers to these questions if you have time.

Look at the animals. How do they move about? Think of other animals and how they move. What causes them to move? Could it be some of the same reasons as the plants?

What can you find the animals responding to, that the plants don't seem to respond to? Make a list of responses noted and responses possible. Be careful not to hurt the animals as this will accomplish nothing.

As usual, a data sheet helps to organize the information you have gathered about the living things. Make a chart that includes all your tests on all the organisms. It may help if you use a check for a response and a blank for no response. Do you need a third symbol for "didn't try"?

Make a list of each organism and the life processes that each performs.

Now compare the organisms: do they all perform the same life processes?

Are there any differences or variations in the way that these life processes are carried out?

Now let's go a little further. Add any amount of organisms you wish to your list along with their life processes. Try and classify or organize the organisms according to their life processes. What conclusions do you reach after you have classified or organized the organisms according to their life processes.